

GOVERNMENT OF INDIA

REPORT

OF

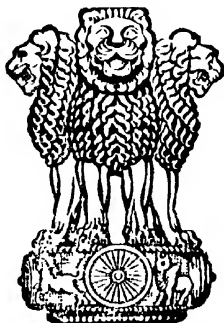
Delegation Sent to Japan

BY

**Ministries of Rehabilitation
and**

Industry and Supply

**TO STUDY COTTAGE AND SMALL
SCALE INDUSTRIES**



सत्यमेव जयते

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**REPORT
OF
DELEGATION SENT TO JAPAN**

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I. INTRODUCTION

Japan's vast industrial empire owed its strength mainly to its small industries 54 per cent. of which were one-man workshops and 40 per cent. small plants employing less than five workers each.

The factory census for 1909, when the industrialisation of the country had reached its peak, showed that factories employing between five and 100 operatives accounted for 96·5 per cent of the total. A similar census for 1938, when Japan's transition from a country of light industries to one of heavy industries had almost reached completion, revealed that factories of the same description constituted 96·2 per cent. of the total.

These statistics do not include the innumerable workshops with less than five operatives each. An expert says that of all Japan's industrial enterprises in 1930, 54·3 per cent were one-man workshops and 40·2 per cent. small plants with two to four workers each. With the expansion of the munitions industries after 1931, factories employing more than 1,000 workers increased appreciably. At the same time, plants with 30 to 50 employees sprang up in large numbers. Still, factories on a tiny scale predominated.

As the biggest exporter of cloth in pre-war days, Japan was running the weaving industry mostly as a small-scale industry. Out of 210,000 workers employed in this line, the large mills employing over 200 workers accounted for only 30,000 or a seventh of the total number of workers. That is to say, 6/7th of the textiles made in Japan were made in small home-factories which are sometimes run independently, sometimes as subsidiaries to large mills. The people of Japan mostly used cloth made in these small factories, and the cloth made in the large mills was meant mostly for export.

The smaller factories produced better varieties of cloth. Silks, brocades and beautiful designs for Japanese kimono (women's dress) were made in these.

The homefactories and the small industries were thus the back-bone of Japan's industrial economy, and we have this much at least to learn from Japan.

Weaving is not the only small industry. Cycles, rubber and electric goods, watches, clocks, cameras, binoculars, fountain pens and numerous other useful articles are made in the small factories.

The cycle industry is a small industry. So is the electric lamp industry. Small factories and workshops manufacture by far the greater proportion of the lamps exported—some manufacturers carry on the work in their own homes, others in small factories. The relations between families making flash-bulbs at home and the merchant employers are very intimate.

The match industry is also mostly a small industry. In 1933 only two plants were employing more than 500 workers, others were small-scale or home factories.

The factors making for the success of small industries were enumerated by the Mitsubishi Research Bureau. They are (1) abundance of electric power at low rates; the ability of the small enterprises, mostly catering for the domestic market, to adapt themselves quickly to changes in fashion; (2) an ample supply of cheap labour; (3) the intimate—almost personal—ties which bind those hereditarily engaged in these industries, and (4) the co-operative relations with the large enterprises.

Home industries make a great contribution to Japan's rural economy also. There are no less than 50,000 home factories in the villages of Japan, which provide supplementary jobs to farmers when they have no farming to do. In 1937, 25 per cent. of farmers could get supplementary work. In 1946, after five years of war, the percentage rose to 46.4. Many war workers have now become farmers.

For instance, three villages have nearly 3,200 factories. Practically every house is a factory. In one village (Ogawa) there are more than 1,000 homes manufacturing handpaper. The Government-run laboratory and training schools for villagers are, of course, an essential part of the organisation of rural industries.

In another village, near Kyoto, a thousand homes are busy turning out beautiful bamboo articles, and purses (which fetch 20 dollars each in America). Girls with the help of small looms turn out a dozen to 20 screens 16 x 29 ft. each—all bound for America nicely packed in Indian jute. The Japanese are manufacturing 1,400 articles from bamboo.

Cottage industries, therefore, provide the foundation of war-shattered Japan's rehabilitation. They are making good progress, and what militarily occupied Japan can do, we can certainly achieve.

II. OUR MISSION

Our Mission was jointly sponsored by the Ministries of Industry and Supply and of Rehabilitation, the former being interested in the long-term objective of promoting cottage and small-scale industries and the latter in the introduction of new industries to provide gainful employment to displaced persons and facilitate their rehabilitation. The proposal was sanctioned in March 1949, and after completion of the numerous necessary formalities we left Calcutta on the 8th May 1949.

On arrival at Tokyo on the 10th May we spent a few days in preliminary discussion with the SCAP (Supreme Commander for the Allied Powers) Government officers, the Head of the Indian Liaison Mission in Tokyo and the Japan and Tokyo Chambers of Commerce. A detailed itinerary was drawn up for visits to industrial establishments in Tokyo and outside. The Japan and Tokyo Chambers of Commerce were very helpful in preparing the programme. After studying the small industries in Tokyo we left on a 35-day tour on the 24th May returning to Tokyo on 28th June. We left Tokyo on the 12th July and landed in Calcutta on the 13th July 1949.

Altogether we visited about one hundred industrial establishments of various sizes. Most of them were either home factories or small scale concerns. The few large establishments we visited were mostly those engaged in the manufacture of machines for small industries. Besides, we visited a dozen institutes for training technicians and for research and the same number of museums and exhibitions of foreign trade samples. We also visited several repatriates' dormitories, women's homes and repatriates' colonies.

Throughout we received the fullest possible co-operation from the officers of the SCAP, Prefectural and City Governments, Chambers of Commerce Foreign Trade Institutes and from the proprietors of the industrial establishments.

As a rule, on arrival at a station we contacted the local Chamber of Commerce and the Foreign Trade Institute. Most of these have museums of local products. We selected the products the manufacture of which was of interest to us and then arranged for a visit to the manufacturing establishment. Here

the process of manufacture and the machinery employed were studied and thereafter we arranged visits to the works where the machinery itself was manufactured.

III. INDUSTRIES VISITED

These notes do not attempt to give an account of the manufacturing processes. Their object is more to stimulate thought than to provide a complete guide to the prospective industrialist. It is our hope, however, that the notes will show that there are definite possibilities of a number of new minor industries being introduced in India. The industries described in these notes are carried out in small workshops often situated in the front room of the house in which the proprietor lives or in sheds in the courtyard. No elaborate factory buildings are needed. The machinery is simple but ingenious and often designed by the proprietor himself and manufactured in a coal workshop. The capital required for making a start is thus small. We were impressed time and again with the excellent quality and enormous quantity of the goods produced for export in very shabby looking workshops. The credit should go largely to the wholesalers and exporters who carefully study the exact needs of the market—both home and foreign—and then get the small workshops to produce the types of goods most needed.

These notes relate only to a few selected industries and a fuller list of existing home industries in Japan is included at the end of this section.

1. BAMBOO INDUSTRY

We studied this industry at Shizuoka, Kyoto, Yamaguchi (near Kobe), Tondabayashi (near Osaka) and Beppu (Kyushu). The industry has numerous well-defined sections which are dealt with below.

(1) *Fishing Rods, Poles for Vault Jump and Rakes, etc.*

These are very easy to make. There is a large market for them in the U. S. A. and Beppu specializes in this industry. The process consists of choosing bamboos of the right length, thickness and elasticity, cleaning and scraping them with caustic soda solution and straightening them after warming over coal fire. Oita Prefecture alone exports 3 million fishing rods to the U. S. A. annually. The factory for making rakes which we visited in Beppu exports rakes worth about \$ 20,000 (Rs. 67,000) annually to the U.S.A., We feel that similar industry should be developed in India, for there are bound to be suitable varieties of bamboo in some province or other. The initiative must come from the exporters who should study the requirements of foreign countries and then organise production in India. We have bamboo forests in many parts of the country which are hitherto not exploited fully and there should be good business potentialities—especially with the dollar block.

(2) *Bamboo Cages, Baskets, Mats, Toys, Knitting Needles, etc.*

Bamboo is cut into pieces of different dimensions with automatic, electrically driven machinery. A workshop usually consists of machines for cutting bamboo into pieces about a foot long and one or one and a half inches wide. Another set of machines cuts the pieces further into thinner rods. The third set rounds and smoothens the surface. There are also a number of electrically operated drills. Thereafter the pieces may either be passed on to women workers who make them into cages, trays, baskets, toys, etc., or to a machine which points and polishes the rods into knitting needles. Since the rods are machine made they are fine and of uniform thickness so that the articles made with them have an artistic appearance.

The machinery for the aforesaid purposes is frequently designed by the proprietor himself and manufactured at one of the numerous small workshops which exist even in the smallest town.

Many kinds of decorative articles are made by glueing together pieces of bamboo and painting them in attractive colours. Here the design is made by an experienced artist and the proprietor of the factory then splits up the model into a number of component parts. These latter are made by home workers with the help of hand tools. The parts are then collected at the factory where workers assemble them and paint and finish the articles. These are mostly sold at tourist centres in Japan and being attractive are readily bought.

(3) *Flower Vases*

Here the bamboo splitting and peeling are mostly done by hand with a special set of knives. Weaving may be of the simplest to the most intricate design. There are research institutes run by the municipalities where workers with long experience are engaged in evolving new patterns. A flower vase which was shown to us at Beppu took three months to make and was priced at Rs. 300. The business in this case is organised by the wholesale dealer knowing the market demands. He supplies raw materials to a large number of home workers and also provides designs.

When the research workers evolve new designs they consult the wholesalers about the marketing possibilities and then go out to the villages to instruct the workers.

(4) *Bamboo Buttons, Buckles, etc.*

The first process is to split the bamboo into pieces about 1" to 1½" wide and about 2 to 3 feet long. Thereafter the pieces are planed and then taken to an electrically driven punching machine which punches out round pieces at a fast speed. The next process is to shape the pieces properly, smoothen their surface and cut decorative grooves. There is a set of simple machines for this purpose, all power-driven. Each round piece is held in a jaw fixed to a rotating horizontal shaft. There is a small cutter in front of the jaw and this cutter is moved forward to do the cutting. Not more than two seconds are required for each operation and the girl operators are very quick in their movements.

Buttons are then taken to automatic drills and polished. Thereafter they are sold to the wholesaler who gets them hand-painted by sending them to home workers. School children are also utilized for painting buttons in their leisure hours. The same factory makes bamboo buckles, hangers and various kinds of handbags. Bamboo handles are supplied to women workers who prepare handbags for the wholesalers.

A set of machines capable of producing 15,000 buttons a month costs about Rs. 4,000.

(5) *Bamboo Veneer and Plywood*

Veneer from bamboo is called Bambania and is a new industry in Japan. The inventor, Mr. Adachi, is coming to India along with the machines which slice bamboo thinly like a long sheet of paper. This method has been patented and registered by the Japanese Government. Bambania can be used in various ways as bamboo-plywood, facing of many kinds of furniture, trays, ceilings, panels etc.

(6) *Bamboo Mosaic*

Blocks are made by glueing together thin strips of bamboo. These are then arranged vertically and horizontally one on the top of another, glued, and pressed together with the help of wooden frame. After drying a composite block is produced. When the block is cross-cut a mosaic effect is obtained. These cross cut pieces are then used for making a number of fancy articles, like cigarette cases, ash trays and buttons.

The process requires machinery for cutting bamboo into pieces of uniform length and width, a triple-planer, and a wooden hand press. The entire machinery for this industry costs about Rs. 3,000.

(7) *Bamboo Bead Ware*

A thin variety of bamboo grown in Kiyushu Island is used. The machinery consists of a number of electrically driven saws with the help of which girl operators cut bamboo pieces into small beads. An expert worker may cut as many as 100 beads per minute. These are then polished in a rotating wooden drum, dyed in various colours, dried in the sun and strung by the home workers to make hand-bags, table mats, baskets, and so on. Beppu specializes in this industry. The only machinery needed is a number of electrically driven saws and a few polishing drums.

(8) *Bamboo Screens*

These are made for export to America. The machinery consists of a bamboo splitter (hand-operated) and power-driven bamboo peelers. Thereafter the thin bamboo strips are made into screens with the help of a treedle loom. This industry is carried on extensively in village Tondabayashi near Osaka which exports screen worth about Rs. 2,40,000 annually to America. There are 150 screen weaving looms in this village in 20 workshops. The population of Tondabayashi village is 2,800 and a quarter of the population is engaged in bamboo industry. The cost of the largest loom (10 feet wide) is about Rs. 1,000 and that of preparatory peeling machines and hand knives is about Rs. 500. A girl worker produces 20 screens per day on these looms (size 6' x 5' - 5").

Bamboo splitting is done by hand with the help of an interesting contrivance. There is a heavy iron wheel with 8-10 holes of various sizes for different sizes of bamboo. Inside each hole is a set of 8 or ten sharp knives. One end of the bamboo piece to be split is put inside this hole. At the other end a push is given with the help of a heavy iron weight running on rails. As the bamboo passes through the hole it is split into 8 pieces or less according to the number of knives.

2. RECONVERTING RAGS INTO CLOTH

Japan believes in wasting nothing. She utilizes pieces of rag for making new cloth. This industry came into prominence in Japan during the war owing to the shortage of cotton and wool. There is a countrywide organisation for collecting rags of all descriptions. School children are also utilized for collecting rags and the centrally collected stock is then sent to the scutching and carding factories. The centre of this industry is Okazaki near Nagoya. This area is hilly and agriculturally poor. This industry has been located here in order to provide gainful employment to the villagers. There is a swift stream in the area which is utilized for water mills. Scutching and carding processes are completed on power driven machines. Cotton is obtained after passing the rags seven or eight times through the scutching machines. It is then carded and made into small rollers. These are placed inside revolving

tubes which act as spindles. The latter are operated by low electric power. One girl can manage up to 500 spindles. The yarn is twined and then put on a twisting machine. The best yarn thus obtained is of 10 to 12 counts.

The spinning can be done either on power or treadle-operated tube-spindles. It is naturally more economical to use power.

The yarn is used for weaving a variety of beautiful textiles for furnishing; and also for making rags, knitted-ware, etc. The cloth produced is so attractive that it is difficult to believe that it has been obtained from rags.

Okazaki has several scutching and carding plants and many home work-shops are engaged in this industry.

The price of a unit consisting of two scutching machines, one carding machine, spinning frames and twining and twisting machinery and accessories is about Rs. 15,000. Two scutching machines and one carding machine can dispose of five hundred lbs. of rags in 8 hours producing about four hundred lbs. of cotton.

It is important to state that this industry also utilises fibrous plants for spinning. In India, hemp, and linseed stem may be advantageously utilised for producing spinning materials. For breaking up fibrous plant accessory equipment costing about Rs. 1,500 and some cement tanks are required.

This industry is called GARABO in Japan because of the peculiar sound which the tube spindles produce when in operation—"BO" is part of the Japanese word for spinning.

3. HAIR PINS

We saw the manufacture of hair pins in Osaka. The most conspicuous feature was the extremely shabby workshops which are situated in a poor locality of the town. The proprietor lives in this lane where he has two workshops. One workshop has two rooms, one about 14 feet by 12 feet and the other 15 feet by 15 feet. The other workshop consists of only one room about 20 feet by 15 feet. These two workshops produce about two and a half million hair pins per month. The factories employ 18 workers including women and girls. Four or five of these are not more than 15 years old.

The first operation is to cut thin iron wire with an electric machine. Decorative wavy designs are made on these with the help of four hand machines all worked by small girls. The hair pins are then finished after dipping in black enamel solution in kerosene. We watched the manufacture of three types of hair pins, all of which are made with the help of simple machines. One type is produced on an automatic machine which cuts the wire into pieces and waves and bends them at a fast rate. This machine is used along with a roller press which first presses steel wire into a flat or hemispherical shape. The only other operation is then to enamel the pins. The workshops we saw in Osaka produce many other types according to the demand from time to time.

The cost of a set of machinery for producing three types of pins and the necessary dies is about Rs. 12,000.

4. CELLULOID INDUSTRY

We visited Fuse which is near Osaka and which is popularly called "Celluloid Village" as it has a number of home factories making celluloid combs, toys, flowers, containers, tooth brushes, etc.

(i) *Celluloid Combs*

Celluloid sheets are cut into pieces of appropriate size with an electric cutter. Each piece is then placed inside a mould and warmed by immersion into a water tank for five to ten minutes. The teeth are cut in one operation with a set of electrical saws. The distance between the teeth can be adjusted according to requirements. The teeth are then sharpened by women workers with hand files. Finally the combs are polished and packed.

In the factory which we visited there were only ten workers and the factory consisted of three or four small rooms ill ventilated and dark. The factory was started with a capital of about Rs. 6,000. Production is about 5,000 dozen combs per month. The combs are exported mostly to Philippines and Hong-Kong. This workshop produces one thousand different types of combs for different parts of the world, and we were impressed with the intimate knowledge of detail which the proprietor had of the requirements of remote countries and islands.

(ii) *Celluloid Flower Making*

The designs are cut out of thin celluloid sheets with the help of hand punches. These are then given to two hundred and fifty homes where the women finish the flowers. The factory premises accommodate 50 workers and the only equipment is a number of hot presses and tools for cutting designs.

If we import celluloid sheets, flower making can be a good home industry. As in making paper flowers, however, considerable manual skill is needed to make artistic celluloid flowers and some Japanese trainers will be needed.

(iii) *Spectacle Frames*

A small workshop manufacturing spectacle frames, we visited in Osaka produces 30,000 dozens frames a year. It has 40 workers and also takes the assistance of about 100 home workers.

5. HAND SEWING NEEDLES

We visited a factory at Nagoya and another in the atom-bombed city of Hiroshima. The factory at Nagoya consists of 2 small rooms. The Hiroshima factory was very much larger. Hand sewing needle making industry is a speciality of Hiroshima which exports about three billion yen worth needles annually of which one billion is imported into India. Eight thousand workers in Hiroshima are engaged in needle making of whom 5,000 are women. In spite of the atom-bomb, Hiroshima is exporting needles to India regularly for two years.

The Nagoya factory employs 14 workers of whom 8 are girls. Soft iron wire is cut into pieces with an automatic wire cutting machine. This is electrically driven. The cut pieces are then put in a bundle inside two cast iron rings about 5" in diameter. The bundle is heated in coke fire and taken out when red hot. It is then rolled for two or three minutes with the help of a heavy iron roller. This operation requires much skill. The object is to straighten the pieces.

The next operation is the sharpening of the points with an electrically driven machine provided with a grinding wheel. Both the ends of the wire pieces are pointed in this operation. The middle portion of the wire is then softened and the pieces are sent to an automatic triple operation high-speed machine where the middle portion of each piece is stamped, drilled and cut into two. Two needles are thus produced from each piece of wire. The pieces are then annealed and polished in three stages and finally packed. The price

of a small unit for making hand sewing needles is estimated at about Rs. 16,000.

6. DOLL MAKING—A DOLLAR INDUSTRY

The Japanese excel in the art of doll making, whether these are French dolls, Japanese dolls of cloth or of porcelain. At least a lakh of workers, part-time and whole-time are engaged in doll making. A special festival called the Doll Festival is celebrated in spring when every home, rich or poor, displays its favourite collection of dolls just as we enshrine our gods in our home-temples. This industry is a big dollar-earning industry also. Japanese dolls find ready market all over Europe and America. Our Indian dolls are also quite popular in America specially because of the variety of our provincial costumes. A doll costing Rs. 3-5-0 in India easily fetches five dollars in the wholesale market and ten dollars in the retail shops.

Porcelain Dolls.—We visited a doll making factory at Nagoya where a large variety of dolls were being made. Every factory has an artist who makes designs and prepares moulds. The moulds are then sent to village kilns at Seto and Yokkaichi where they are fired and burned. They are then returned to the doll factory for painting and dressing. We found this factory full of packing cases destined for America. The factory itself is located in about 4 rooms and 30 workers are employed, half of them women. The dressing and painting process is divided into a number of simple jobs and each worker is expert in just one operation. For instance, one girl is responsible for only dipping the head of the doll into a bowl containing black paint to represent the hair. This job-splitting process results in larger production.

We visited another establishment in Tokyo where lessons are given in doll making. The teacher himself is an artist of long standing who can design new models and make moulds. In Yokkaichi village near Nagoya which specialises in pottery making, we also found that the work of designing was given great importance and highly qualified artists were employed for this purpose.

7. WOOD-TAPE WARE

Hiroshima makes a large variety of articles like plates, trays, flower pots, out of cedar-wood tape. The tape making factory is in a different Prefecture where there are plenty of cedar trees. The tape is wound on a wooden wheel like a potter's wheel which revolves by electric power. When a disc made of tape is obtained, glue is spread over it and after drying, a few holes are made right through the disc with an electric driller. Thin bamboo nails are inserted inside these holes to keep the tape together. The disc is then pressed in a hand press and later the rims are hammered to form a variety of shapes. The articles so made are then lacquered and they fetch high prices in Japan and abroad.

During the War unlacquered plates were made in large numbers from wood tape as there was shortage of metal plates. Now the articles are mostly lacquered and sold as souvenirs to tourists.

This factory has 15 workers and the total investment is less than Rs. 2,000.

8. STRAW WARE

Manufacture of straw ware is one of the important village industries of Japan. Beautiful boxes of coloured straw, hats, slippers, ladies hand bags, mats, sacks (of rice straw), christmas decoration articles and numerous toys are made from straw and sold at tourist centres. Most of the smaller articles are very delicate and do not last very long but their beauty and artistic design tempt the tourist to buy them in large numbers.

Wheat and barley straws of right thickness are selected by passing them through a sieve. These are then split with a hand splitter into 2, 3 or 4 pieces for weaving into braids. The hand splitter is a simple wooden tube inside which 2 or 3 cutters are fixed, and splitting is accomplished by passing each straw through this tube. After splitting the pieces are softened by passing through rollers which may be hand or power driven. The pieces are then sent on to home workers who weave them into braids. Each braid may be woven out of 3, 4 or 5 strips.

Before splitting the straw may be dyed in a number of colours.

The braids are stitched into hats or other articles with the help of a special sewing machine.

Straw braids are exported in large quantities to South America and to the U.S.A. where they are used for making hats. Last year, four lakh and eighty thousand yards of braid were exported by one factory in Kure near Hiroshima (which we visited) to Central America and U. S. A., Malaya and South Sea Islands prefer broad braids while America likes narrower ones.

The straw to be used for braid making should be as long as possible. The stalks should have their leafy sheath intact so that the straw underneath may remain spotless and clean.

The factory which we visited has 11 workers. In addition four hundred workers mostly women are engaged in splitting and weaving the braids at home. These are collected at the central factory and exported after inspection and packing. No elaborate machinery is required for this industry, which it will be seen, is capable of providing employment to a large number of home workers.

9. SHELL WARE

Shell industry is responsible for at least eighty artistic articles mostly sold at tourist centres.

Shells abound in Japan and are put to good use by the craftsmen. Some of the shells are just hand-painted in attractive colours and sold mounted on small shell stands. Small painted wooden dolls are placed inside shells creating a very pleasing effect. The tops of shells are artistically shaped to make fancy inkpots. Then again four or five long conical shells are strung together to make little dolls which are dressed up with feathers. Some types of shells are glued together to make large birds or other animals. The larger shells are made into ash trays. There are hand painted pictures on wooden slabs on which shells are glued for additional decoration. Collections of many types of shells are also sold in attractive little boxes.

Shell-ware and other similar novelties are generally not sold in shops in ordinary towns and cities but only at tourist centres. These tourist towns mainly consist of a picturesque bazar, where such novelties are attractively displayed. These towns and makers of the tourist articles entirely live on local and foreign tourists. The Japanese are themselves quite tourist-minded and tourist centres are always crowded.

10. SHELL BUTTONS

Manufacture of shell buttons is a flourishing industry of Japan. We visited a shell button manufacturing factory near Osaka. This factory is engaged in making buttons from Trochus shell imported from Guam Island and America. This is a conical type of shell. The average length of the shell is about 2" but may be even upto 4". The diameter of the base is about 3". The local Japanese shells are said to be unsuitable for button-making and some Japanese

varieties crack while being punched. The Trocus shells also crack if too old. We are large importers of shell buttons. It should be possible to develop this industry in India in a short time. The technique is quite simple.

The first operation is to punch round pieces out of the base of the shell with electrically driven punches. Punching can also be done by treadle machines without the use of power but the use of such machines was given up by the factory about 20 years ago. After punching pieces from the base the sides of the shell are punched. The round pieces so obtained are shaped into buttons with the help of electrically-driven grinder and then holes are drilled into them. Drilling is done either by power or treadle machine.

The last process is polishing and finishing. The buttons are placed into a revolving drum with chemicals for polishing. They are then steamed in a tank containing caustic soda solution, and placed in a revolving drum with some lustre giving chemical. After drying they are placed in a revolving drum with wax powder for final finish.

In the month of March alone this factory exported 2 million yen worth of buttons to India. The factory can produce, 344,56,000 buttons per month. The total number of workers is fifty.

The rim of the shell is used for making self-shank buttons and thus no part of the shell is wasted. A lot of shell powder is produced during the button making process, and is used for mixing with whitewash for painting walls and as poultry feed mixed with other foods.

The cost of a small shell button making unit is less than Rs. 10,000.

11. BULB MAKING

In Tokyo there are about 50 small-scale factories besides the large ones manufacturing bulbs. A factory which we visited had only 16 workers and its capacity was 50,000 bulbs a month. The factory was started after the war with equipment worth Rs. 5,000 only. Within four years the assets have increased tenfold, i.e., to Rs. 50,000. The income per month is Rs. 7,000. When we asked the proprietor how much profit he was making he said that a few months ago it was 30 per cent. but now it was 15 per cent.

This factory buys the outer cover of the bulb and sockets ready made. The inner tube is made here and filaments are fixed to it. The fusion of the inner tube and the outer cover is done on a rotating machine on which are four or five gas flames. The bulbs are then taken to a chamber where vacuum is created and the bulb is dehydrated and sealed.

Many of the smaller workshops specialise in making small bulbs for torches and Christmas decorations. One of these workshops which we visited is located in the front room of the house in which the proprietor lives. The number of workers is only six while the daily production is 2,000. The raw materials are glass tube, copper wire, tungsten filament, brass sockets and lead. Blowing the bulbs and fusion of the copper and tungsten filaments are done with the help of ordinary gas flames. There is hardly any complicated machinery and many of the operations are done by girls, some of whom are less than 15 years old. The cost of the main machines, viz., the spot welder, vacuum arrangements and anchor machine is less than Rs. 4,000 excluding the cost of electric motor and gas plant.

In a Repatriates' Colony which we visited in Tokyo, making of small bulbs was one of the vocations. It should be possible to introduce small bulbs making industry in India as a cottage industry. Making of larger bulbs in home factories is more difficult because the outer covers cannot easily be made

in small workshops. We were told that there are automatic machines for making small bulbs also but the hand produced articles are better. Complete automatic machinery for making large bulbs is available in Japan.

During the war repair of fused bulbs was started in Japan because of scarcity of glass but recently this business has been closed since there is no shortage of glass. Some Department Stores used to run special sections for bulb repair all over Japan. During the war, when there was shortage of glass many small workshops used to collect damaged bulbs and after changing their filaments, sold them as new.....

12. FOUNTAIN PENS

Indian market is just now flooded with cheap fountain pens. A factory we visited in Tokyo had 3 women and 9 men workers and was started 20 years ago with a capital of Rs. 2,000 only. Now its capital assets are worth about Rs. 10,000. It produces 500 dozens pens a month. The celluloid tube, rubber tube, nibs and nib feeder are all made in other factories. This factory does the fitting, finishing and marketing. The cost price of each pen is 147.5 yens which is equal to eighteen annas.

13. PAPER WARE

Japan makes three hundred articles from paper. Paper is spun into yarn which is woven into cloth. Bed-sheets, table cloths, napkins, slippers, and several other articles of daily use are made of this cloth. Purses of artistic designs are also made of paper yarn.

Purses from paper.—This is a prosperous industry in Shizuoka city. A wholesaler purchases paper thread from the mills at Okitsu, nearby. He supplies it to 300 homes for making knitted purses. The designs are supplied by the wholesaler. The purses are made by women with crochet needles or by a process of tying knots. Some of the more expensive purses have oil paintings which again are done by the home workers.

Paper threads are of various thickness and are made in a number of colours. They are covered by cellulose for water proofing.

We also visited the abovementioned paper mill at Okitsu where paper thread was being manufactured. The process is a simple one. Paper sheets are rolled on rollers. The roller is rotated by means of a belt and the operator cuts the rolls into thin disks with the help of a sharp knife. Thus a large number of disks of narrow paper ribbon about 2-4 milli-metre wide are obtained. The disks are then put on spindles and the ribbon is spun. Thicker threads are obtained by twisting together two or three thinner threads. Water proofing is done by passing the thread through a tin box containing cellulose composition.

Paper thread widely used in shops for packing parcels. It is also woven for making furnishing-fabrics, slippers, etc. In the committee room of the paper mill at Okitsu the furnishing were of paper cloth and in the ceiling also cloth made of paper yarn was used.

14. PAPER LANTERN MAKING

Paper lanterns are made in large number for domestic and foreign consumption. They have beautiful floral designs and the blocks for making them are jealously guarded by the owners so that others may not produce similar designs. The designs are produced with the help of wooden blocks and stencils. As is the usual practice in Japan, each worker specialises in a particular operation; for instance, one girl paints the paper with a brush and obtains a

rainbow effect by applying three different colours to a broad brush. A little glue is mixed with the paints to make the paper stiff. After the paper is dried, the second girl passes the painted sheets over wooden blocks with floral designs. The sheet is then passed on to the third girl who paints some flowers with the help of stencils. The fourth girl then colours some of the parts of the flowers with a brush.

The ribs of the paper lantern are made of thin bamboo wire purchased from another factory.

We also make simple kinds of paper lanterns for Diwali celebrations, but we could manufacture them in our relief centres for export. It is worthwhile trying to produce floral designs on paper for various decorations. Paper lantern making is one of the common vocations in women's social welfare centres in Japan. In fact it is a women's art and we have artists in India who can develop it for foreign markets—again a dollar industry.

15. MECHANICAL TOYS

Japan enjoys a worldwide market for mechanical toys. Nowhere else in the world half mile long bazars are exclusively devoted to toy selling as in Tokyo's famed district Asakusa. Several thousands home factories are engaged in toy making. Despite tin shortage and lack of dollar exchange, Japan is manufacturing millions of mechanical toys today from used cans thrown away in the dust bins of the American Occupation Forces who live entirely on canned foods, imported from America.

A factory which we visited employs 200 workers, about 140 of whom are women. Amongst the women about 60 per cent. are below 20 years of age and they are recruited with little previous training. This factory was started five years ago with a capital of Rs. 12,000. The monthly production of this factory is 10,000 dozen toys. The tin required for toy making is recovered mostly from empty cans by a process of cutting and rolling. There are a number of foot presses and also two or three heavy presses worked by power. Besides, there is a workshop for making dies, and for spray painting. The factory makes as much as 20 per cent. profit.

We visited another organisation in Tokyo which was being run on co-operative basis. In a bomb damaged area some new wooden houses had been built and in each of these, parts or toys were being produced. Part of the house was being used for the residence of the family and part for the workshop. About 20 families are participating in this scheme. The co-operative society gives loans for the construction of the houses as well as for the purchase of equipment. We should organise this industry on similar basis in every province.

The President of the Tokyo Toy Manufacturer's Association who initiated this scheme has been invited by us to India.

16. WATER COLOURS

Manufacture of water colours and crayons on small scale basis in India can provide jobs for many. We visited a factory in Tokyo which employs 30 workers—half of whom are girls. This factory started with a capital of Rs. 1,800 only. The pigments are purchased from outside and they are mixed and filled in tubes in this factory. The tin tubes are bought from another factory. Fifty different kinds of pigments are produced. There are four electric-grinders and three automatic tube fillers and sealers. It is interesting to note that sweet potato syrup is used as one of the components.

17. UMBRELLA MAKING

This industry, run on small scale, has great possibilities of developing into a major industry in India since an average family rich or poor needs at least one or two umbrellas for protection from the scorching sun and the rain. We in India generally assemble umbrellas and have to import ribs, a large portion of cloth and even the better quality of handles. Everything could be completely made in India since we have the raw material, but we mainly depend on Japan to protect us from the sun and the rain.

In Tokyo alone there are 150 umbrella factories, 25 workshops for making ribs, 8 handle making factories and three rod makers. Rib making requires a small factory. We visited a factory which was being run on a family basis. There were 12 workers, including five members of the family. This factory starts operations on carbon steel rods which are obtained from another factory. In the rib making factory there are 20 machine tools, all of a special type. Four of these were somewhat complicated and we were told proudly that they had been evolved by the family engineers themselves. The workshop shed was about 80' x 30' and the cost of machines Rs. ten to twelve thousand.

The ribs are sold to the umbrella makers by the dozen. The latter also purchased the central rods and handles from elsewhere. The cloth for the umbrella is of a special type and is obtained from weavers in another Prefecture. The umbrella maker whom we visited was a member of a co-operative society which helps him in getting cloth at controlled rates. He has two girls as assistants besides his wife, daughter and son and he produces 1,500 umbrellas per month.

The cost price of the ribs, handle, rod, and cloth for one umbrella was given as 1,000 Yen (*i.e.*, about nine rupees). Labour per umbrella costs 70 Yen. The official selling price is 1,179 Yen per umbrella (*i.e.*, about ten rupees).

18. BOBBIN MAKING

Bobbins are imported into India in large numbers. We observed in Japan that it is an automatic and simple process. We visited a bobbin-making factory in Gifu. The unit consists of a number of wood-working machines all power-driven. Each machine is used for one operation only. A unit costs about Rs. 14,000 to Rs. 15,000. This industry has a large scope in India and should be given encouragement.

19. TOOTH BRUSHES

For an everyday necessity like tooth brushes we have to depend on America, England and Japan. Japan makes cheap tooth brushes from bamboo and celluloid in home factories.

In Osaka, we visited a factory employing 15 workers. The workshops are situated in two sheds in the courtyard and two rooms in the second storey of the house in which the family lives. Downstairs in the front room of the house is the 'office', where the name of the maker is stamped and brushes packed for export.

The handles of the tooth brushes are made of either bamboo or celluloid. They are made in another factory elsewhere, owned by the same family. The bristles are produced in Japan and brought from wholesalers. The first operation is to drill holes in the brush where tufts are later fixed. After drilling, the handles are polished.

There were two machines for cutting the bristles into tufts of uniform length and shape, and for fixing them to the handles there were four machines. All these are automatic and power-driven. The tuft fixing machine was somewhat complicated and had been designed by the family engineers who were most reluctant to tell us where similar machines could be had.

20. SHOE LACES

Shoe lace industry in Japan can be described as a combination of small-scale and cottage industry. We visited a factory which forms the centre of shoe lace industry situated in a farming village near Shizuoka. In the centre of the village is a small-scale plant equipped with electrically-driven machinery. Here cotton, silk or rayon yarn is braided into shoe lace by mechanical power but beyond this the shoe lace thus braided goes through various phases of a home industry, metal fitting, packing, etc., all done as side jobs chiefly by the women and children of the neighbourhood. Metallic tips for laces are made from carbon steel band by hand or power-driven machines. Tips are fixed to the laces with the help of a small hand machine which is manufactured by the lace-making factory itself. We visited a factory in Tokyo which distributes these machines to about 200 homes and the work of fixing the tips is done by women at homes.

In the factory in Tokyo there are only 30 workers, 13 of whom are women. Production is 20,000 gross pairs per month. The main markets to which shoe laces are exported by this factory are Canada, Hong Kong and America.

21. CUTLERY INDUSTRY

There are three famous hardware and cutlery producing centres in Japan—Miki near Kobe, Seki near Nagoya and Sanjo in the province of Niigata. Miki alone manufactures 60 per cent. of the cutlery and hardware. Miki is making millions from the iron bands with which we pack our cotton bales exported to Japan.

We visited Seki near Nagoya which has been very famous for cutlery for a long time and its annual production is worth about 500 million Yen. The biggest cutlery factory in Seki has 200 workmen while the smallest has only 10. The average number of workers employed is 30. The bigger factory distributes the raw materials to the small units consisting of less than 10 workers. Each unit specialises in one particular operation. For instance, one is engaged only in sharpening, another in polishing and the third in assembly. The division of work amongst the units is on the basis of particular operations and not on the basis of the items produced. A few of the smaller units, however, make complete articles themselves instead of carrying out one particular operation for the benefit of the bigger factory.

There are about 5,000 houses in Seki of which about 500 are engaged in making cutlery.

22. BICYCLE INDUSTRY

Bicycle industry in Japan is another small industry. Only four per cent. of the workmen are in factories employing more than 200 workers and 8 per cent. in factories employing from 100 to 200 workers. Sixty-five per cent. workers are employed in factories each employing less than five hands. Before the war a cycle could be had in Japan for Rs. 7.

It is common knowledge that the bicycle is the assembled product of a larger number of component parts. In Japan, only a small number of the larger factories manufacture more than two kinds of parts or accessories, other

factories limiting themselves to the production of just one or two component parts of the completed bicycle. Manufacture of component parts was first established in Japan with the idea of producing various parts necessary for repairing the bicycles imported from abroad. It was possible to establish and run small factories for making parts with about 500 Yen (then Rs. 400, now only five rupees). Standardisation of the various parts of the bicycle was one of the prime factors which made a small factory system possible. The machines are often simple and can be operated by house-wives or children.

The three important features of the bicycle industry are:—

- (1) There is a high division of labour. Not only is the manufacture of just one part by one factory the common practice, but in a great many instances, even the manufacture of one part represents a division of labour between several factories, each employing labour best suited to its own peculiar needs.
- (2) As the technique required in this industry is comparatively simple, labour can be drawn in the main from the ranks of juvenile or unskilled labourers.
- (3) The problem of supervision of labour is rendered easy.

Nagoya is one of the important centres for this industry. We were told by one of the men engaged in this industry that Nagoya has about 1,000 factories making cycle parts. About 700 of these are small factories and 350 are very small employing 4 or 5 workers only. There are only about 10 large factories in Nagoya which produce bicycles and the largest of these has about 2,000 workers.

We visited one of the very small home factories. Here the owner had four employees and his 15-year-old daughter also operated one of the machines. There were four machines in all, situated in the front room of the owner's two-room house. He has specialised in making nuts for the last 12 years and makes about 1,500 nuts every day for selling to the big cycle factory. He gets the raw materials from the factory to which the nuts are sold.

Next door is another home factory. This receives hub castings from the large factory and is responsible for finishing them. There are four machines and the owner himself and one employee are the only workmen. The owner lives in the same house.

We also visited a medium size factory, with 200 employees, which is engaged in making hubs and pedals. Linked with this are 10 small home factories. The smallest of them has only five workers.

There is no special organisation to distribute work amongst the large and small factories. The large factory designs and plans and distributes parts for manufacture amongst the small factories on payment basis. The raw materials are also supplied by the large factory.

Nagoya at present has only about one tenth of the factories which it had before the war and production is about one-eighth of the pre-war level.

23. CAMPHOR

This is a speciality of Kyushu Island. Five to six hundred factories are engaged in making camphor in Kyushu Island alone and most of these are small home factories. Eighty per cent. of the camphor produced in Japan is from Kyushu. The company which arranged our visit has 400 home factories in Kyushu Island.

The Camphor trees which abound in the hilly forests of Kyushu are bought from the Forest Department and the logs including the roots are chipped with the help of a kerosene engine-driven chipper. The best camphor is produced from trees which are about fifty years old. The chips are boiled in closed wooden tanks and continuously heated at about 1000°C. The vapour is led into a series of tanks filled with water and the camphor and camphor oil float on the water after condensation. They are collected from the surface of the tanks once a month. The products are then put in a small wooden vat and pressed with hand hammers. The camphor oil drains off through a pipe at the bottom of the vat and is collected separately. The crude camphor left in the vat as well as the camphor oil are then sent to the refineries. The camphor oil yields about 50 per cent. more camphor and the refined oil is used for making medicines, perfumes, etc.

Refineries are large factories. A small camphor home factory can make about one ton camphor and camphor oil per month. The capital required for such a factory is Rs. 5,000. The factory which we visited in Yamaemura Village about sixteen miles from Fukuoka was situated in a shabby shed built behind the house in which the owner lived.

24. STARCH MAKING FROM POTATO AND SWEET POTATO

Japan has developed this industry on scientific lines during the last fifty years. There are several types of machines for this industry, all run on small horse power. The sweet potatoes are put into the machine and mixed thoroughly with water. There are grinders inside which crush the sweet potatoes. The mixture of starch, waste matter and water passes into two tanks, one for the starch and water and the second for the waste matter and water. The former drains off into another tank where the starch settles down. The waste sweet potato is used for making alcohol, bread or as cattle fodder. No less than a dozen products including biscuits, confectionery and malted milk can be prepared from sweet potatoes.

(i) *Conversion of sweet potato into Syrup*.—60 kilos of sweet potato or potato starch are put in a kettle about 3½' in diameter. Water is added with about one pound of fermenting diastase. It is then warmed in slow fire at about 80°C for three hours. In the course of heating the components get well mixed up. The kettle is then covered and heated upto 100°C. After the second heating the surface is skimmed. It is then allowed to come down to about 55°C to 60°C. Natase is then added. In this condition it is left for about 7 hours. It is then filtered into a second kettle and heated to 100°C to 110°C until it becomes thick and heavy. The heating is needed till the initial foam disappears.

By this process a syrup is obtained which is utilized for making candy. Starch syrup is prepared usually by the cottage workers who make the starch and they sell it in tins to candy makers.

(ii) *Candy*.—The syrup obtained by the above process is boiled to 135°C and then poured on a large tray with running water underneath. Essence and colouring matters are also added at this stage and a little tartaric acid. As the syrup cools it is kneaded and drawn in the form of a thick sheet. This process is a common scene at any *halwai* shop making *reori*. The sheet is then cut into candies with the help of a candy roller cutting machine operated by hand. The candy drops dry in a few minutes and are then packed. We visited a candy maker's home in Osaka where the father, mother, son and daughter were engaged in candy making in one room of their house. They produce 800 lbs. of candy a day which is sold for about Rs. 450. The starch syrup is bought in tins from wholesalers.

25. OIL EXTRACTION

Japan has numerous kinds of oil expellers. Some are hand-operated and others are operated by low-powered engines. We visited an oil pressing workshop which has two hand presses and one power press. The workshop has eight workers, mostly family members. Sesame seed is crushed in a crusher and then roasted for 19 minutes and steamed for 8 minutes. For roasting and steaming there is a large vessel about 4' in diameter with a boiler at the bottom. After the roasting is over, steam is let into the vessel from the boiler. There is a stirrer inside the vessel which moves by electricity.

After steaming sesame is put inside the expeller, and the lever is moved up and down till the pressure is 400 kgm.

Rice bran oil.—Oil can also be extracted from soya bean, rape-seed, ground-nut and rice bran. The last need not be crushed. It is roasted for 7 minutes and steamed for 5 minutes. It is then put into the expeller. To get the best results, oil should be extracted from rice bran not more than five days after it is produced during the rice polishing. If the bran is old, the oil in it evaporates and decomposes.

Unrefined rice bran oil is used for soap making, paint making, for making ointments, pastes, and mobiloil, etc.

Refined rice bran oil is edible. Oil comes out of rice bran at a pressure of 200 kgm. A hand press takes out upto 8-10 per cent. oil and power press 13 per cent. The oilcake is used as fodder or manure.

In Japan the Agricultural Ministry arranges to collect bran and distributes it to villages having oil presses. For every 15 power presses there is one refinery. The cost of a refinery is about Rs. 16,000.

In India most of the rice bran is wasted. If we must eat polished rice, it is criminal to waste rice bran, especially when it can yield 10 per cent. oil without much effort. The Provincial Governments should encourage this industry in rural areas on co-operative basis.

26. GLOVE MAKING

We visited a factory at Nagoya which was engaged exclusively in making gloves, chiefly for export to Canada. It had a number of small flat knitting machines which can be used only for making gloves. There were a few circular knitting machines also for finishing. There was a machine for making gloves look 'woolly'. This was a revolving drum with pine cones fixed to it. The gloves are held against this drum for a few minutes before being packed. Some of the gloves are sent to a social welfare centre where poor women workers embroider floral designs on them. We can also make socks, gloves, pullovers, etc., in our refugee relief centres; and if the quality be excellent such hand-made articles can command good prices in foreign countries where hand labour is very expensive and hand work is highly appreciated. The articles can be sold in America and Europe if we maintain their standard.

27. EMBROIDERY

Japanese women are all embroidery-minded. Every town and city has special schools teaching oriental and occidental embroidery, dressmaking and other women's arts. Embroidery is also a popular vocation in the social welfare centres. One factory which we visited in Kyoto employs about 15,000 girls in its 15 branches. The girls earn about one rupee per day. There are no instructors but the girls pick up the work themselves. They start producing right from the start and in three months become expert at intricate jobs. The room in which the girls were working was very spacious, neat, well-ventilated

and clean. The girls sat on benches and worked on cloth held tightly in wooden frames. In the centre were two tables at which the designs were transferred on the cloth.

The embroidery was not particularly fine but the products had very good finish. The success of the establishment seemed to be due entirely to good management, which means careful study of the market requirements and keeping the workers contented and cheerful. This establishment is sending embroidered goods worth lakhs annually to the U.S.A.

We visited at Shimizu another embroidery works, where the goods made in about 30 centres are collected, finished and packed for export. These 30 centres in turn depend for their produce on home workers.

We see no reason why embroidered goods should not be produced in India for export abroad.

Indian embroideries of older designs of rural taste are very popular in America and can be used for evening coats, curtains mantlepiece table covers and bed covers. The older the design the more it is appreciated. This industry can easily prove a great dollar-earning business for India. Embroidered pictures depicting scenic beauty and historical monuments will be very popular abroad.

28. HAND-PAPER

Hand-paper is made from many different plants. Three of these are—

- (i) Mitsumata (*Edgeworthia chrysantha*).
- (ii) Kozo (*Broussonetia Kaempferi*, Seibi).
- (iii) Gampi (*Wikstroemia sikokianum*).

The barks of the kozo and Mitsumata are stripped at the beginning of winter. Gampi trees are peeled in spring and summer. Pieces of cut branches of the kozo and mitsumata are steamed before their bark is stripped. The gampi bark comes off after boiling. Bundles of wood are boiled in a cauldron and the stripping is done while the branches are warm. For this purpose, the entire family is mobilised.

The bark strips (kurokawa or black skin) are temporarily stored after complete drying. Later, they are soaked in running water for several hours. As they soften to some extent, the outer covering is removed with special peeling knives by skilled hands. What remains goes in for another soaking in running water, at which time discernible flaws such as knobs and fissures are removed. The result produced is called shirokawa or white skin.

The shirokawa is then boiled in a mixture of lye and water until it becomes so tender that it can be easily torn with the fingers. After five or six hours the refined bark is due for another running water treatment and is then beaten for a long time on a wood or stone surface. The pulp is mixed with a sticky extract of *Hibiscus manihot* (*Abelmoschus manihot*) which assists in strengthening the final product. The pulp is strained and left in a container overnight.

The following day it is pressed into sheets and later spread on wooden board. This is set out in the sun to dry. Under favourable conditions an average craftsman is able to dry between 1,000 and 1,500 sheets a day. The faint outline of wood grain which gives the paper attractive distinction is said to be the result of this drying process.

Lately some labour-saving devices have been incorporated to speed up production. In addition chemicals are being employed to bleach the kurokawa. In spite of this, the industry still defies complete mechanisation. The Japanese paper is still a handmade product requiring arduous toil and skill born of years of experience.

Branches of mulberry tree are also used for making paper, the newest branches are cut from spring to autumn. They are then soaked in water, crushed, boiled and made into pulp.

Special arrangements have been made in Japan for giving training in the latest technique in hand-paper making. We visited one such training centre, viz., the Gifu Prefectural Paper Research and Training Institute at Minomachi village where 200 sons and daughters of persons who make paper at home are given training. This Institute is situated in a hilly area where fibrous trees needed for paper production abound. Most villagers in this area are engaged in paper making as a subsidiary occupation. The duration of training in this Institute is usually only one week and the main subject taught is the handling of the screen. No fee is charged. The Prefectural Government spends Rs. 1,50,000 annually on this Institute.

LIST OF COTTAGE AND SMALL-SCALE INDUSTRIES IN JAPAN

1. Bamboo Baskets
2. Bamboo Bags
3. Bamboo Beadware
4. Bamboo Buttons
5. Bamboo Blinds
6. Bamboo Chairs and Furniture
7. Bamboo Fans
8. Bamboo Fishing Rods
9. Bamboo Mosaic Arts
10. Bamboo Plywood
11. Bamboo Rakes and Poles
12. Bamboo Screens
13. Bamboo Tiles and Ceiling Materials
14. Bamboo Toys and Dolls
15. Bamboo Flower Vases
16. Bamboo Knitting Needles
17. Bamboo Brooches
18. Bamboo Nails and Hinges
19. Bamboo Bobbins
20. Bricks
21. Bulbs
22. Brushes
23. Bottle Crowns
24. Buckles and Garters
25. Brooches (Wood, Celluloid, and Glass)
26. Brooms
27. Buttons (Brass, Glass and Nuts)
28. Canned Goods
29. Camphor
30. Candles (Fancy)
31. Candy
32. Clocks

33. Celluloid Combs
34. Celluloid Flowers
35. Celluloid Containers and Boxes
36. Celluloid Toys
37. Celluloid Spectacle Frames
38. Cutlery
39. China Ware
40. Chip Braid
41. Chalks
42. Crayons
43. Cattle Hoof and Horn Industries
44. Decoration Materials
45. Chenille
46. Wood Shaving Ropes
47. Colours and Dyes (Home made)
48. Dried Vegetables and Dried Fish
49. Dolls
50. Embroidery
51. Embroidery Pictures
52. Eyelets for Shoe Laces
53. Engines (Oil and Petrol)
54. Fans
55. Fibre Goods
56. Fishing Nets
57. Fishing Nets Machine
58. Fountain Pens
59. Fly Powder, Fly Paper
60. Conversion of Rags into Cloth
61. Gold and Silver Threads
62. Gem Clips
63. Glass Ware
64. Hand-paper
65. Hand-paper Lanterns
66. Hand-paper Parasols
67. Hand-paper Stationery
68. Hand-paper Artistic Wares (*c.g.*
Writing Pads, Wall Paper)
69. Hair Goods
70. Hair Pins
71. Hosiery
72. Looms
73. Liquid Soap (for Toilet Rooms)
74. Matches
75. Mushrooms
76. Mechanical Toys
77. Nail Making

78. Needle making Machines
79. Oil Expellers
80. Pop Corn Machine
81. Paper Yarn and Cloth
82. Paper Purses.
83. Paper Ropes
84. Puffed Rice
85. Paper Shoes
86. Pyrethrum
87. Rice, Bran Oil
88. Rabbit Farming
89. Rope Making
90. Rosin (from Pine)
91. Rosaries
92. Sweet Potato Starch
93. Sugar Cotton
94. Shell Buttons
95. Shell Ware
96. Spinning Wheels
97. Sericulture
98. Silk Goods
99. Straw Ware
100. Straw Braid Making
101. Straw Boxes
102. Straw Pictures
103. Soya Bean Milk
104. Soya Bean Cheese
105. Soya Bean Products (Miscellaneous)
106. Tooth Brushes
107. Talcum Powder
108. Tanning
109. Tape Making
110. Umbrellas
111. Umbrella Ribs and Machinery
112. Thermos
113. Varnish Making
114. Vinegar Making
115. Wood Work
116. Water Colours
117. Wood Shaving Bags
118. Wood Shaving Cushions
119. Wood Tape Ware
120. Wax (Vegetable)
121. Zip Fastener (partially Home Industry).

IV. TECHNICAL EDUCATION IN JAPAN

Industrial education is one of the main pillars of Japan's industrial structure.

Industrial education is one of the main pillars of Japan's industrial structure. polytechnic schools and industrial continuation schools. Next to the United States of America and pre-war Germany, the universities of Japan provided excellent facilities for industrial education. To enter the industrial colleges it is necessary to pass six years in primary school, three years in middle school and three years in higher school. Students come to the university at the age of 18-19 and it takes them three years to complete the university course. Two hundred polytechnic schools and about 2 dozen high schools of technology turn out every year thousands of qualified technicians. The polytechnic schools are the foundation stone of industrial education. They are maintained by provincial Governments. They admit those who have completed six years in primary school, though there are some which require higher qualifications. They usually have a three-year course, in some cases with a two-year or even five-year course, and have departments in mechanical, chemical or civil engineering and architecture, while there are some others which confine themselves to textiles, ceramics, or such other principal industries of the locality where the school is established. There are special schools for training in making hand paper, photography, watch-making, mining, electricity, etc. Some schools give morning, afternoon and evening courses. Thirty to forty thousand students are annually trained in these schools which employ nearly three thousand teachers.

Industrial continuation schools generally give two years training to those who take up jobs after passing out from primary schools. The Departments of Agriculture and Commerce also provide similar training courses for workers. The whole structure of education in Japan is now undergoing changes under American occupation.

Japan is far advanced in social industrial education which is imparted through a wide network of science museums, commercial museums, libraries, motion pictures, radio, public lectures and industrial publications. Every branch of industry has special publications which provide details of latest inventions and best designs in each industry. Such publications are profusely illustrated and thus enable a simple home manufacturer to make those designs. Manual training and industrial education are an essential part of school education. India should draw up and carry out a similar plan of social industrial education for cottage industries.

The Japanese education system produces marvellous results. We witnessed in the Freedom School near Tōkyō (founded by a woman journalist) fourteen-year-old boys being taught to make cycles, school desks, chairs, watches and blue prints of machinery.

We shall give short description of some of the institutes which we visited.

The Izuo Technical High School, Osaka.—This has a capacity for 700 students and teaches—

- (i) spinning,
- (ii) dyeing,
- (iii) ceramics,
- (iv) chemical engineering,
- (v) Applied Chemistry.

Besides the day classes, the school runs evening courses for 260 students. The courses in these schools include as compulsory subjects, foreign language, history, mathematics, chemistry and Japanese. About half the time is devoted to general education and half to technical.

The workshops in these schools are well-equipped. The weaving and spinning class has more than 30 looms not only of Japanese make but also those in use in different parts of the world. The textile section had not only weaving and spinning but also lace-making and embroidery machines, flat knitting machines and hosiery machines from Switzerland and America.

The annual budget of this institution is Rs. 8,000 and the annual salary bill is Rs. 3,000. Funds are provided by the Osaka Municipality. In Osaka City the Municipality runs four such schools.

Industrial Arts Schools, Osaka.—Besides technical high school, Japan also has a number of Industrial Arts Schools, where handicrafts and fine arts are taught along with general subjects. The admission age in these schools is also 15 to 18 years and the courses are of three years duration. The Industrial Arts School at Osaka, which we visited, has 406 students in the day classes and 350 in the evening classes. There are separate teachers for the day and night classes.

The subjects taught at this School are:—

- (i) Metal Arts;
- (ii) Wood Crafts;
- (iii) Commercial Arts and Textile Designs;
- (iv) Architecture;
- (v) Fine Arts (both foreign and Japanese paintings).

The compulsory subjects are:—

- (i) Social Study;
- (ii) Japanese Language;
- (iii) Mathematics;
- (iv) Physics;
- (v) Chemistry;
- (vi) Physical culture.

Each student has to choose one subject out of the handicrafts group. He has also to take certain optional subjects like English and History. Approximately 35 per cent. of the time is devoted to technical subjects and the rest to general.

We were very much impressed by the abundance of technical talent in Japan. Indeed without it Japan could not have such a large number of workshops which are to be found in the smallest towns and villages. The men in charge of most of these workshops are practical engineers who have passed the primary school and thereafter completed education in one of the numerous technical high schools.

Training of operatives.—So far as craftsmen are concerned some of the technical high schools have courses in mechanical engineering. In many of the large engineering workshops which we visited, we were, however, told that the recruits were drawn from boys who had just passed out of the primary schools. The process of job splitting is so complete in large workshops that the recruits find it easy to learn one simple operation within a few weeks. We found these recruits easily fitting into their one operation jobs even in industries like bulb making, clock-making and manufacture of oil engines.

V. INDUSTRIAL RESEARCH

Most towns in Japan have Industrial Research Stations which are run either by the Central and Provincial Governments or the local municipalities. The functions of these institutes are to conduct research with a view to improve the technique and disseminating information about new processes and designs amongst manufacturers. Here we give descriptions of Research Stations in Kyoto, Fukuoka and Beppu.

(i) MUNICIPAL INDUSTRIAL EXPERIMENTAL STATION, KYOTO

This Station has the following sections:—

- (i) Chemical Section;
- (ii) Lacquer and Wood Work;
- (iii) Bamboo-Ware;
- (iv) Metal-Ware;
- (v) Potteries.

It has a research staff consisting of 13 engineers and 39 research workers.

The workshops are very well equipped. For instance the pottery section has at least 4 kilns. In the bamboo section, research is being carried out for making buttons from bamboo plywood with coloured mosaic designs. The lacquer section has a large well-equipped laboratory.

The Institution has also a big sample room with a beautiful collection of local mineral stones, potteries, cloisonne and bamboo work, plastic-ware, etc. All these articles are produced in the workshop of the Institution itself and represent new designs and use of new materials. This sample room is visited by local producers who discuss the methods of production with the technical staff. Wholesalers doing business in these commodities also visit the sample room and give their opinion as to the marketability of the goods.

Once a month the institution holds a meeting to discuss the problems of producers and explain to them new techniques.

The annual budget of this institution is Rs. 43,000.

(ii) FUKUOKA INDUSTRIAL RESEARCH STATION

This Institution is engaged in research in the following industries:—

- (i) Silk Weaving;
- (ii) Soyabean Products;
- (iii) Manufacture of Vegetable Wax;
- (iv) Ceramics.

The Station has a technical staff of 30 and the annual budget is Rs. 97,500. The Ceramics department is in the charge of an artist of long standing and we saw many works of art which had been manufactured in this Section under his guidance. This Section has a well-equipped library too. The chemical department is mainly engaged in research work on soyabean products. In the chemical section, research is also being conducted on vegetable wax which is extracted from *Rhus succedanea* which grow in abundance in Kyushu Island. After extraction the wax is clarified.

Fukuoka is famous for Hakata silk and the silk department is engaged in evolving new designs for neckties, borders, etc.

(iii) VOCATION GUIDANCE INSTITUTE, BEPPU

This is similar to the Research Institutes at Kyoto and Fukuoka described above and is run by the Prefectural Government. It is worthwhile noting that both Beppu and Fukuoka are situated in a small island called Kyushu to the south-east of the main island. Each of these two places has its own research station. This emphasises the importance which is attached in Japan to research stations as a part of the programme for industrial development.

The main feature of the Beppu Institute is a well-developed bamboo section which has 8 research workers. Each of these is a practical workman with long experience. The workers are engaged in evolving new designs for flower vases and baskets. The designs are intricate and the articles very delicate. New designs are propagated through—

- (1) Sample exhibitions;
- (2) Photographs in the monthly bulletin called "*Vocational News*" Published by the Commerce and Industries Department of the Japanese Government;
- (3) Library maintained at the Institute itself where producers and workers can study the drawings;
- (4) Meeting arranged through the Bamboo Manufacturers' Association at which new processes are explained and discussed.

The annual budget of this institution is about Rs. 20,000.

All the above measures could be profitably adopted by us.

VI MACHINERY PURCHASED

(1) FOR THE MINISTRY OF REHABILITATION

A complete list of the articles purchased for Ministry of Rehabilitation is appended. The goods were selected for purchase by us and the formal contracts were entered into by the Head of the Indian Liaison Mission which is also making the payments.

The articles ordered on behalf of the Rehabilitation Ministry may be grouped as follows:—

I. For Displaced Women

(i) *Spinning Wheels*.—Three types have been ordered, namely shibaura Motor Spinning Wheel (1), Sakamoto's Spinning Wheels (6); and Yamamoto Wheel (1). The first will be useful in places where electric power is available. The machine is neat and compact and originally we intended buying 50 sets. The manufacturers cannot, however, guarantee the quality of the wood supplied which may crack or warp under Indian conditions. Sakamoto's Spinning Wheel can be used not only for spinning but also for twining. The 10 sets of treadle spinning frames (10 spindles each) which have been ordered as part of the equipment for making cloth from rags may also be used by women. All these types are of simple design and may be easily adopted.

(ii) *Paper Thread*.—Many kind of ladies' hand-bags are made from paper thread by crochet or by a process of tying knots. Half a ton paper thread has been ordered in assorted colours and a few samples of hand bags have been purchased. This will be a profitable industry in the displaced women's homes.

(iii) *Chenille Toys*.—Four types of chenille material have been ordered. These can be made into a large variety of toys of which also some samples have been ordered. This also will be a new industry for women's homes. Japan

exports to America large quantities of Christmas and Easter decorations, toys etc., made of chenille.

(iv) *Noodle Making* (50).—Noodles can be made of varying thickness and breadth according to Indian tastes. Many women should be able to earn enough with these machines, which are very easy to handle and efficient.

(v) *Hosiery Machines*.—Two of these have been ordered just as samples. The machines selected are light to work and can be used by women. A woman worker can make two dozen socks per day at home.

II. For Pavement Shops

Hand Printing-Presses.—Ten have been purchased. These are small and handy machines and we have seen them being operated on the pavements in Japanese cities. They are used for printing visiting cards, invitation cards and hand-bills delivered on the spot.

(ii) *Pop Corn Making Machines* (5), *Rice Pressing Machines* (5), *Bean Roaster* (5), *Sugar Cotton Making Machine* (1), *Sugar Cane Crushers* (4).—Pop Corn and Rice Pressing Machines should be a novelty for India and we hope that pavement shopkeepers will be able to make good money out of them. The former can be used both for rice and corn. Sugar, cotton is not a new thing in India but the machine in use in Japan will probably be an improvement on the Indian machines. The same applies to Sugar Cane Crushers which are simple but modern.

III. Small scale Industries

(i) *Bamboo Wares*.—We have ordered complete equipment for the following industries.---

- (a) Making knitting needles, cages, mats, toys, baskets, etc.
- (b) Making buttons, buckles, etc. The buttons may be decorated by sand painting which will provide occupation to many homes and school girls.
- (c) Splitting and peeling bamboo.
- (d) Making screens on treadle looms (one girl can make 12 to 16 screens per day).
- (e) Making flower vases (some samples have been purchased) in the workers homes.
- (f) Making of bamboo veneer and plywood which may be used for table tops, tiles, panels, ceiling, furniture, etc.

A Japanese adviser and assistants will be in charge of the installation and operation of all machinery in connection with the bamboo industry and will train our workers.

(ii) *Cloth from rags*.—The unit consists of two scutching machines and one carding machine. The two single-ring scutching machines break up rags thoroughly which are then carded to produce soft cotton like material. This may be spun, doubled and twisted on the sets of power-driven machines which have been ordered, or spun on treadle spinners which also have been ordered (10 spindles each).

Rag collection is another activity which will provide employment to some persons and an organisation for this purpose will have to be built up. The scutching machines are capable of dealing with 500 lbs. rags per day, which will yield 400 lbs. cotton.

A technician recommended by the manufacturers of the plant is coming to India to set up the plant and see to its initial operation. The bamboo adviser selected for appointment in India has also much practical experience of this industry and will be in general charge. He has his own factory in Kyoto.

As an accessory of this plant we have bought machinery for breaking up fibrous plants like linseed and hemp into cotton-like material.

(iii) *Braids and Shoe Laces*.—A set of 14 machines has been ordered which is capable of turning out many kinds of flat and round braids and if rubber thread is used, elastics can also be prepared. The machines can be operated either by power or by hand. They also make a variety of shoe laces, both flat and round.

The metallic tips of shoe laces can be made in the mechanical toy plant which has been ordered. For fixing these tips to the laces there is a simple hand machine which also has been ordered. The tips and the laces may be distributed to refugee women along with the hand machines.

The manufacturer of the braiding machines is personally coming to India to set the plant in motion.

(iv) *Mechanical Toys*.—A small unit has been ordered. It consists of a number of foot-operated presses and some other machine tools. The plant will be capable of making metal toys both with and without springs. Complete sets of dies for two toys have been ordered, one of which is for a spring motor. We should have liked to have more sets of dies which are about the most important items in toy manufacture, but the cost is heavy and it will be better to start manufacture of dies in India itself. The toys will be mostly made of tin recovered from empty cans. Equipment for recovering sheets from empty cans has also been ordered.

One adviser for mechanical toys is coming to India. He is President of the Tokyo 'Toy Manufacturers' Association. The same plant can be utilized for making a number of other small articles, including metallic tips for shoe laces.

(v) *Sweet Potato Starch and Products*.—Two machines for making starch from potato and sweet potato have been ordered. The starch can be used for making syrup which again can be used for making sweets. For the latter some small hand operated machines are required and have been purchased.

(vi) *Hosiery*.—Two flat knitting machines of good design have been ordered.

(vii) *Nail Making*.—Two Nail-making machines together with accessories have been ordered. They are capable of making wire nails at high speed—200 per minute.

(viii) *Miscellaneous*.—

(a) Straw rope making machine	.	1	
(b) Wheat Flour Mills	.	2	
(c) Card-board cutter	.	1	
(d) Universal Cutter	.	1	
(e) Oil Expellers	.	8	(or two types)
(f) Electric Cloth cutter	.	2	(This may be used in a small workshop for making garments).
(g) Automatic treadle looms	.	4	of one type.
		1	of another.

During demonstration of the latter loom the outturn was over 40 yards per eight hours. During actual operation for a day it may be less but still considerably more than on the ordinary loom. For the

first type about 50 yards per 8-hour day is claimed and it can be worked either by treadle or a small motor. We have seen both types of looms being worked by women and girls in their own homes.

The machines which have been purchased are generally-speaking on an experimental basis. If successful, more units may be purchased by Provincial Governments and private parties. Many of the machines are of simple design and can be manufactured in India after making the necessary adaptations to local conditions.

(2) FOR THE MINISTRY OF INDUSTRY AND SUPPLY

The same types of equipment have been purchased for the Ministry of Industry and Supply as for the Rehabilitation Ministry except that for the former only a few pieces of each units have been ordered. For instance, while 10 Job Printing Machines have been ordered for the Rehabilitation Ministry, only two have been ordered for the Ministry of Industry and Supply. We did not consider it necessary to buy larger plants such as mechanical toy plant in duplicate for the Ministry of Industry and Supply. Similarly, so far as the Garbo Spinning Plant is concerned, only one spinning frame has been taken for the Ministry of Industry and Supply and the scutching and carding machines have been omitted. However, for the Ministry of Industry and Supply larger variety of machines have been purchased for demonstration purposes. Some of the machines which have been purchased for the Ministry of Industry and Supply and not for the Rehabilitation Ministry are mentioned below:—

- (1) Starch Biscuit Baker;
- (2) Coal Briquette Machine;
- (3) Fishing Net Making Machine;
- (4) Silk Reeling and Weaving Set and Accessories;
- (5) Needle Making Machine (Power);
- (6) Bale Making Machine;
- (7) Screen Making Machine;
- (8) Carding Machine;
- (9) Fodder Cutting Machine.

About the end of our stay in Japan we received instructions from the Ministry of Industry and Supply for purchasing plants for bamboo industry and accordingly we have ordered machinery for making buttons, knitting needles, plywood, etc. These plants can be installed in a bamboo production centre or a provincial branch of the Central Technical Institute.

VII. AGRICULTURAL MACHINERY

During the course of our tour we came across many manufacturers of agricultural machinery who are anxious to find a market in India. We were particularly impressed by the large variety of agricultural machinery available at comparatively cheap prices. In Japan cattle is rarely available for agriculture, and operations are carried out by men and women with the help of small agricultural machinery. So far as we know, little use has been made in India of Japanese agricultural machinery and we think that it should at least be given a trial, as the prices are comparatively low and the machines are decidedly efficient. To mention a few instances there are many types of rice hullers, rice polishers, threshing machines, oil extractors and tractors. Small machines for the home as well as large ones are available. Some are operated by hand or foot and others by motors and oil engines.

One tractor known as the Shibaura Garden Tractor is priced at \$250 f.o.b. Japanese port. It works on a 3 H.P. Kerosene engine, has a weight of 420 lbs. and tractive power of 440 lbs. at 2.7 miles per hour. This can be used for ploughing, harrowing, making furrows, sowing, etc., with appropriate attachments. Another type, *viz.*, Kubota's T-25 tractor is priced at \$1400 f.o.b. Japanese port. It has a maximum horse power of 40 and can run on gasoline or kerosene.

To give another example, the Zuiko Rice Huller is priced at \$210 and is said to be capable of producing 60 to 80 bushels hulled rice per hour. It can be worked with a 4-5 horse power oil engine. The Nishio Rice Polisher works on about the same horse power and can polish 200 bushels rice per day (10 hours). Its price is \$30. Smaller rice polishers are also available, the smallest costing only \$13. This runs on one horse power oil engine and the outturn is 40 bushels per day (10 hours).

Many kinds of oil engines are in use in the country-side, and it is common during the harvest season to see threshers operated in the fields and on the roadside by oil engines.

Some of the better-known manufacturers of oil engines are Kubotas, Mitsubishi and Arisaka who are producing kerosene oil engines with different power. They are useful for driving agricultural machinery and the prices are low.

We recommend that Japanese agriculture machinery may profitably be adopted for our needs. The introduction of small agricultural machines in our rural economy will help in setting up several cottage and small industries and encourage co-operative use of agricultural machines at a nominal cost to the villagers. At present villagers in some districts have to travel miles to get their wheat or rice milled at abnormal expense of time and money. This can be avoided if officially organised facilities for maintenance and repair of small machines are provided.

VIII. TECHNICIANS FROM JAPAN

Many Japanese technicians are willing to come out to India and if applications are invited thousands and thousands of them would be received. No useful purpose is served by following this procedure. The best procedure is to select technicians on the recommendation of the manufacturer who supplies the machines. As a rule, the Supreme Commander of Allied Powers gives permission to Japanese technicians to leave Japan only if they are recommended by the manufacturer. In other words, technicians can come to India only if machinery is purchased and for the sole purpose of installing it, seeing to its initial operation and training of our workers to run it. The SCAP is interested in safeguarding the interests of the Japanese nationals abroad and has an elaborate contract from which has to be signed in the case of each technician.

The emoluments to be paid to the Japanese technicians also require the approval of the SCAP. The general rule is that the emoluments in India should be the minimum required for decent living. In addition free board and lodging, medical attention and insurance have to be provided by the foreign employer. The emoluments in foreign country must not be such as to enable the technician to build up an asset outside Japan. The balance of the emoluments has to be paid in dollars in Japan. For this purpose the employer has to open a letter of credit before the technician leaves Japan. The SCAP pays the monthly allowance to the technician's family through the manufacturer of the machinery purchased.

We have selected the following Japanese technicians for employment in India:—

Industry	Designation	Name
Bamboo Industry	Adviser	Mr. Masayoshi Adachi.
	Technician	Mr. Akira Hoson
	Technician	Mr. Yoshio Kudo.
Garabo Industry	Technician	Mr. Saichi Suzuki
Mechanical Toys and Allied Industries	Adviser	Mr. Motosuzo Kosugi.
Braids & Shoe laces	Adviser	Mr. Kadanasuko Kokubun.

Technicians Available.—We interviewed about 25 technicians in Tokyo, Osaka and Nagoya whom we had selected from amongst about 2,000 applications received by the Indian Liaison Mission, Tokyo. We were impressed by the qualifications and experience of the following:—

- (1) Mr. Hideo Hayase, Fuse City, Osaka. He graduated from the Special Technical School, Tokyo, attached to the Tokyo Arsenal and has worked in ammunition factories. He has experience of forging aluminium, steel and duralumin and has worked in workshops manufacturing and repairing agricultural machines.
- (2) Mr. Taro Hayashe of Kashiwara-cho, Osaka Prefecture. Has several years' experience in cotton spinning and is capable of installing machinery for making sewing thread.
- (3) Mr. Tashio Inoue, Hyogomachi, Takamatsu City. He is an industrial engineering graduate of Kyoto University and has worked in steel and iron works making heavy machines, rolling mills, press mills, etc. Has experience of making furnaces and designing of steel buildings.
- (4) Mr. Ryojisa Masuda, Amogasaki Kyogo-Ken. He is a casting expert and has worked in Kubotas. He is chief of an iron casting company employing 300 workers. This company is engaged in making cast iron parts of bicycles. Also makes iron pipes. He is anxious to go to India and organise a large iron casting plant in India. He seems to be an expert in his job.
- (5) Mr. Takamasa Tanaka, Nakagawachi-gun, Osaka Prefecture. He and his brother are taking out a patent for making fibre yarn out of rammie. He has also experience of linseed and sun hemp fibre.
- (6) Mr. Tsuneichi Sumitomo, Oe-gun, Tokushima-Ken. He is a mining and geological expert and was sent to Brazil by the Japanese Government for mineral investigations, particularly nickel, gold and diamond. He has also carried out such investigation in Java, Borneo, etc., on behalf of a private company. He is qualified in mining and geology and his main line is prospecting. He is good but rather old.

- (7) Mr. Kanimoto Hidejiso, Amagasakishi. Is a general machinery expert and has specialized in workshop "efficiency". Has also large experience of training workers.
- (8) Mr. Shoshichiro Kikuchi, Nishinomiya City, Osaka. He is very keen to get to India. He is a chemist and has 20 years experience of manufacturing chemical minerals. Can make superphosphates, acids, organic nitrogen from soyabean cake, raw cotton waste and superphosphates from rotten fish and fowl droppings. Can make potash from ashes of wild plants. He is 54 years old.
- (9) Mr. Akio Somaia. Speaks English well and has very good experience of manufacture of machine tools.
- (10) Tsuneechoya. He is a hides and skins expert and knows tanning and dyeing.

If any of the above persons is needed by the Central or Provincial Governments the Indian Liaison Mission will have to be approached for further negotiations.

IX. TRAINING OF OUR TECHNICIANS IN JAPAN

Under the present conditions private technicians cannot go to Japan for training. This is unfortunate as we have much to learn from that country in the field of cottage and small-scale industries. It is our opinion that as soon as conditions permit large number of our technicians should be sent to Japan for practical industrial training. The technicians to be selected should have sufficient practical experience in India before being sent out so that they can pick up the methods of work easily. This training should be distinct from the training of students in the numerous engineering and other technical colleges and institutions in Japan, the emphasis being more on practical training in workshops than on academic studies or research.

Facilities available.—The Supreme Commander of Allied Powers has an arrangement in force at present under which technical personnel from the Allied Countries can go to Japan and have full access to scientific and technical information. Under this arrangement India can send two technical representatives at a time. The duration of their stay in Japan is limited to two months *i.e.*, we can send twelve officially sponsored technicians every year. We understand that we have not been able to make full use of this privilege. It should be possible to draw out a schedule for the next two years under which experts in Sericulture, Textiles, Ceramics and other industries can visit Japan, and we suggest that the Industry and Supply Ministry should do so immediately in consultation with the Commerce Ministry so that the privilege may not be wasted. Japanese manufacturers are, generally-speaking, very willing to help and co-operate and our experts should be able to collect much knowledge useful to Indian industry.

X. SOCIAL WELFARE CENTRES IN JAPAN

We visited social welfare centres in Tokyo, Nagoya, Kyoto and Osaka. In Tokyo such centres are run by a semi-official organisation which gets a subsidy from the Tokyo Municipality. These centres provide gainful employment to needy women and although they have been in existence for several years, lately they are being used more or less exclusively for the benefit of repatriates from Manchuria, Formosa, Korea, etc., and for the air raid sufferers.

In Tokyo there are about 30 such centres providing employment for 4,000 women. In Kyoto there is a central home and four branches. 260 women work

In the premises of the centres and about 600 work in their own homes. In Osaka there are 6 such centres which provide employment to 900 women—300 in the centres and 600 in their own homes.

The centres are run by the respective municipalities. Each worker gets a minimum wage of about 50 to 80 yen per day. If she produces more, the wages are correspondingly higher.

The system for provision of work is interesting. The official management of the Centre obtains orders from manufacturers and wholesale dealers. Sometimes it has to advertise to secure orders. Orders are received not necessarily for whole articles. They may be for a single part, or the order may be to finish some article. The articles are made to order for the wholesaler and given over to him. Sometimes, the wholesaler also sends his own staff to give instructions to the workers so that they may produce the exact quality of goods he requires. The wages are paid to the workers by the centre and are ultimately recovered from the wholesaler who is required to deposit the funds with the Municipality. In this way the management is saved the trouble of marketing the goods and at the same time the workers are assured fair wages. There is no problem of unsaleable articles accumulating in the centres.

Some of the vocations at these social welfare centres are mentioned below:—

1. Tailoring. (We saw large tailoring establishments at the Homes in Tokyo and Osaka. They were mostly engaged in making uniforms and in Osaka dresses out of the cloth supplied by the "Licensed Agencies for Relief in Asia" were being prepared.)
2. Twining home spun yarn.
3. Knitting of laces.
4. Knitting of paper thread articles with crochet.
5. Making of small springs for the radio with the help of small hand machine.
6. Woolen knitted garments. (At the Tokyo centre the women were making socks, and gloves. Hundreds of bundles were lying ready for packing for being exported. At Nagoya, the women were engaged in hand embroidery on woollen gloves received from a hosiery factory.)
7. Embroidery (Pillow cases, table cloths, and napkins were being embroidered for export to America in the centre in Kyoto.)
8. Doll dressing. (Celluloid dolls were being decorated with bird feathers, cloth pieces, etc.)
9. Paper flower making.
10. Making of paper masks for fancy dresses for dances.
11. Printing. (The workshop in Osaka was engaged in printing forms for Government.)
12. Making of caramels.
13. Repairs to radio and clocks.
14. Making of perfumed oil, cream and face powder. (The Perfumers' Association, Osaka, placed the orders on this centre.)
15. Making of trays for rearing silk-worm.
16. Making of paper lanterns.

The centre at Kyoto was about to start a three months' training course for a class in repairing of sewing machines and applications had been invited (Women could be similarly trained in India to their great advantage).

In Japan, training is free. The workers start getting a minimum wage immediately on admission and the earnings increase as they acquire skill. So far as the home workers are concerned they attend the Institute about once a week to take instructions and raw materials.

There is a committee for selecting candidates for admission out of long waiting lists. In making selection the circumstances of the family are taken into account. The candidates are also selected on the recommendation of MINSEIIN who are honorary social workers. The MINSEIIN are appointed by the Government on the recommendation of the Municipality and the Prefectural Government.

Most of the centres have day nurseries for the workers' children.

These institutions have been in existence in Japan for several years for the needy persons and are linked with unemployment assistance. In India Women's Homes have come into existence for the benefit of displaced persons but the need for them will continue permanently.

We were very much impressed with the zeal and energy with which women at these centres were doing their work. Production was on large scale and because the orders are placed by the wholesalers or manufacturers, the management is not bothered with the problem of sale. This is a system which seems to be worth adoption at our displaced women's homes. Many of the commodities being produced were intended for export. Our women in India are also good at knitting and embroidery, but none of their products are exported and, indeed, there is difficulty in marketing them even in India. There is scope for active collaboration between the women's homes and the wholesalers so that marketable goods may be produced in large quantities.

XI. OUR RECOMMENDATIONS

We submit the following proposals for the consideration of the Central Government.

(1) Proposals regarding the use to be made of the machinery purchased.

As far as possible, the small-scale industries for which machinery has been purchased should be started in Delhi or its neighbourhood in one compact area. The advantages of this will be:—

- (1) The Central Government will be able to study the commercial aspect of each industry.
- (2) It will be possible to supervise the industries properly and help them to get over the initial difficulty more easily if they are located in one place than if they are scattered over different Provinces.
- (3) Representatives of Provincial Governments will be able to study the working of the machinery conveniently at one place.
- (4) The Japanese technicians who do not know any English can be housed together and proper arrangement made for their food, etc., if they all live in one place. They will feel more at home if they live together. The language difficulty will also be easily overcome by having only one interpreter.

The articles which have been purchased for pavement shops should be made over to selected displaced persons in Delhi and a study made of their

earnings. More machines may be ordered if it is found that they are sufficiently remunerative.

The article purchased for the Women's Homes should be made over to the Homes, where an effort will be made to copy the models which have been purchased.

So far as the equipment and machinery purchased for the Ministry of Industry and Supply are concerned it will be an advantage to have them all installed in a Central Institute in Delhi. Arrangements should be made for their practical working and demonstration and studying the production capacity and suitability for local materials. This Institute should become the nucleus of a Research Institute where different types of equipment will be assembled from all parts of the world and a continuous study made of the machines. Here foreign machinery will be adapted to local conditions and its special features incorporated in the indigenous equipment. This Institute will be visited by officers of the Provincial Governments as well as private parties wishing to start small-scale industries. A scheme for such an Institute should be immediately worked out and necessary beginnings made this year.

In any case, pending the launching of such a scheme, arrangements should be made for the location of the Japanese machinery which will begin to arrive in India from the middle of August onwards.

(2) New Industries

We feel that India can derive great benefit by organising cottage and small-scale industries on the Japanese lines. Advantages of the Japanese system are obvious. Production cost is low because of better output resulting from personnel supervision. In a bigger unit supervision over a large labour force is beset with difficulties. Moreover, in the home factory members of the family can work conveniently in leisure hours without interruption in their domestic duties. We recommend that the following industries should be started on home or small-scale basis in India with the help of Japanese machinery and technicians either directly under official control or through private enterprise with full Government support and guidance:—

1. Hand Sewing needles
2. Pins
3. Hair Pins
4. Gem Clips
5. Safety Pins
6. Celluloid articles like Spectacles Frames, Combs, Flowers, Containers, Toys
7. Wire Nails
8. Blue Cut Nails
9. Hinges
10. Shell Buttons
11. Shell Ware, like Ink Pots, Dolls, Pictures, Toys
12. Glass Buttons and Artificial Pearls (Glass)
13. Torch bulbs
14. Umbrellas (Ribs, Handles and Rods and their assembly)
15. Shoe Laces
16. Braid

17. Hosiery
18. Bobbins for the Textile Industry
19. Water Colours
20. Crayons
21. Ink
22. Hand Paper and its products
23. Mushroom Culture
24. Articles made of paper yarn, *e.g.*, purses, Slippers, Furnishing Fabrics, Tableware
25. Camphor and Camphor Oil
26. Oil from Rice Bran and its products
27. Straw Ware (*e.g.*, Hats, Mats, Braids, Flower Baskets, etc.)
28. Christmas and Easter Decorations
29. Dolls, Masks
30. Paper Envelope Making by simple machines
31. Mechanical Toys
32. Cutlery
33. Surgical Instruments
34. Razor Blades
35. Fishing Nets
36. Paper Flowers, Crepe Flowers
37. Bamboo industry—
 - (i) Fishing rods
 - (ii) Rakes
 - (iii) Plywood
 - (iv) Tiles
 - (v) Mosaic and Fancy Articles made therefrom
 - (vi) Flower Vases and Baskets
 - (vii) Knitting Needles
 - (viii) Buttons
38. Rabbit Farming
39. Sweet Potato Industries

3) Target Dates

Many of the industries recommended above are such that if they are developed in India, imports could be substantially curtailed or altogether stopped. For such industries targets should be fixed after which imports from abroad should be stopped. Other industries recommended are primarily for developing our export trade.

4) Integration between large and small-scale industries

Some industries recommended above need close integration with large-scale industries. A few examples are given below: —

- (1) Hand sewing needles, pins, gem clips, nails and hairpins cannot be manufactured on small scale basis unless wires of appropriate gauge and quality are manufactured in the country. On the other

hand, if production of wires is undertaken in a large factory in sufficient quantity, they can be purchased by the small industries and made into pins, needles, nails, etc. The machines for manufacturing these articles are small and can be easily installed in the homes. If Government imports these machines in large numbers and distributes them to home-workers, displaced persons and others, the country can hope to become self-sufficient in these commodities.

- (2) Manufacture of celluloid articles can be undertaken in home workshops if celluloid is manufactured in the country. We import large varieties of celluloid goods not only from Japan but also from England and America. If celluloid manufacture cannot be started in the immediate future, celluloid sheets may be imported to be fabricated here into consumer goods. Thus we will be effecting a considerable saving in our imports of celluloid goods and also providing work for several thousand workers.
- (3) Manufacture of bulbs can be started on home basis if arrangement is made for the manufacture and supply of materials like tungsten and molybdenum wire, copper wire and brass base, and for the gas-filled bulbs, nitrogen or argon gas.
- (4) Camphor and camphor oil can be distilled in the home workshops, but refining needs a large factory and integration is necessary.
- (5) Paper yarn may be made in the large factory and distributed to home-workers for making purses, table cloths and table mats.
- (6) Parts of bicycles, sewing machines and many other useful articles can be made in home workshops according to standards laid down by the assembling factory.

(5) Import of machinery

(a) At present there are restrictions on import from dollar areas which act as a serious handicap. We recommend that at least 5 lakh dollars should be earmarked in our dollar budget for the import of Japanese machinery for cottage and small-scale industries. Import may be either by the Central and Provincial Governments themselves or by private parties sponsored by them. Import regulations in the case of machinery should be simplified as much as possible so that the small industrialist is not harassed by rigidity of rules.

The Ministry of Rehabilitation should import suitable Japanese machinery for supply as loan in kind to displaced persons.

(b) Customs duty on the import of machinery for cottage and small-scale industries should only be nominal so as to keep the cost to the small man as low as possible.

(6) Japanese Technicians

During our tour everywhere we were presented applications from qualified Japanese technicians with long experience in various small industries. On the other hand, our industry is complaining of shortage of qualified technicians. There are only two ways of filling the deficiency; either we send our workers abroad for training in small-scale industries or we invite foreign technicians to launch new industries and train our workers. Since there are restrictions on our workers proceeding to Japan for training and the expenses for those permitted will be heavy, it will be economical to invite qualified technicians from Japan who will be able to train, say, a thousand technicians in a year. There is no lack of talent in India and we are confident that our workers, after a few months training, will be able to replace foreign technicians and take full charge of the industries.

We, therefore, recommend that each province should make a beginning with half-a-dozen new industries for which technicians, if not available in India, may be invited from Japan. This we will need about a hundred technicians for the whole country. This should be done on thoroughly planned all-India basis and not by each Province on its own. Every effort should, however, first be made to make use of Indian technicians.

(7) Export of Products

Export trade must be developed to balance our national economy today. The whole nation should be export-minded like Japan. With proper organisation it should be possible to find foreign markets for the products of the existing and new cottage and small-scale industries. The following suggestions are made for consideration:—

- (a) A Central Foreign Trade Institute with branches in each Province and important industrial centres should be established. The Institute and its branches should consist of Government representatives and representatives of local industries and businessmen.
- (b) Foreign Trade Institute should organise museums of local products of exportable quality and keep in touch with the producers and technicians with a view to advising them on the needs of the foreign market.
- (c) Small but permanent museums of Indian products should be organised in first class hotels in cities like Calcutta, Bombay, Madras and Delhi which are visited by foreign traders. We found such museums in leading hotels all over Japan.
- (d) Foreign Trade Institutes should occasionally organise large-scale exhibitions of special export products and invite foreign traders, tourists and foreign representatives and their wives and staff to criticise our products and suggest improvements. Such exhibitions are also common in Japan.
- (e) Embassies should have museums of Indian products and these museums should be widely publicised. But mere opening of such museums may not yield much business unless the products are also occasionally exhibited in large and popular hotels and Universities before the Christmas and other special festive occasions.
- (f) We should invite one or two leading buyers from America to visit our cottage industry emporia and production centres and suggest improvements and new designs which would find favour with American consumers. This expense will be amply repaid in the improvement of our designs and avoiding manufacture of unsaleable articles.
- (g) Delegations sponsored by the Foreign Trade Institutes should be sent abroad to study and explore new markets. Japan is well-known for sending such delegations to all parts of the world, and the Japanese Government has published a book called "New Markets in India". Such delegations are financed by Chambers of Commerce, Foreign Trade Institute, manufacturers' associations and municipalities. Every municipal office even in smaller towns has a Chamber of Commerce and an Export Trade Museum.

It is essential in this drive for export to secure the fullest collaboration of businessmen as Government initiative by itself will not prove adequate. We came across many small manufacturers in remote villages in Japan who had intimate knowledge of the needs of different markets of the world. In one village in Japan, cloth was being printed in the Jaipur style for export to the Gold Coast, Africa, to be used as lungi. Intimate knowledge can only be acquired by parties of persons who go out with the sole purpose of studying the

requirements. In Japan, it is the exporter who very often organises production by securing the raw materials, distributing them to home workers and guiding them as to the type of goods to be produced. Collaboration of the businessmen must therefore be secured and the export drive should not be left in the hands of over-worked officials alone.

(8) Information Centres

(a) An Information Centre should be set up in the Ministry of Industry and Supply which will collect information from Japan and other countries regarding machinery for cottage and small-scale industries. This Centre will also collect information about measures taken in other countries for the promotion of small-scale industries. Provincial Governments and persons wishing to start small industries should be able to derive much benefit from such centre.

(b) An Industrial Information Section should be set up in the office of our Commercial Counsellor in Tokyo which will collect literature published by the Japanese Government regarding small-scale industries and supply it to India. This Section will also keep up-to-date information about machinery available in Japan and answer inquiries addressed to it by the Information Centre in India, Provincial Governments and private parties. The collection of such information should be one of the normal functions of the Indian Liaison Mission but staffed as it is at present, it is well-nigh impossible for it to undertake such work. The Commercial Counsellor considers that the Trade Section is particularly understaffed. This Section should have one Technical Officer of five to seven years' standing and one or two Japanese employees. Expenditure on the latter will not be the liability of the Government of India so that the only cost involved will be the pay and allowances of the technical officer.

(9) Central Museum of Foreign Machinery and Samples

A Central Museum of Foreign Machinery and Samples should be established which should display a collection of machinery in use for small-scale industries in different parts of the world. This museum should also display a collection of samples of cottage and small-scale industries from different countries for helping our producers to evolve new methods and designs and for suggesting to them new uses of raw materials available. If necessary, arrangements should be made to purchase the patent rights for manufacture of foreign machines and using foreign processes.

(10) Research Institutes

Central and Provincial Technical Research Institutes should be established as in Japan. The functions of these will be to carry out continuous research into production techniques, to produce new designs, and disseminate information amongst producers. These Institutes should also issue bulletins dealing with various small industries and handicrafts and should have libraries of technical publications.

(11) Tourist Industry

Tourist industry should be properly organised and retail shops of handicrafts should be attached to each travel office. We have described in the report how Japan is able to effect brisk sale of many products at tourist centres.

CHAMAN LAL,
Honorary Secretary, All-India
Cottage Industries Board,
Ministry of Industry and Supply,
Government of India.

N. C. SHRIVASTAVA,
Deputy Secretary,
Ministry of Rehabilitation,
Government of India.

APPENDIX

LIST OF MACHINERY PURCHASED

Articles	Maker	Unit price	Rehabilitation	Industry and Supply	Rehabilitation	Industry and Supply
		\$			\$	\$
<i>Mechanical toy Plant—</i>						
Mechanical Toy making plant which includes the following :—	..	3361·00	1 Plant	..	3361·00	..
1. Foot Press (70-Kan-type)	10 sets	..	..	..
2. Power Press No. 3 belting type	1 set	..	..	..
3. Power Press with gear	11 „	..	..	..
4. Used tins Recov- ering set	1 „	..	..	..
5. Grinder, double headed	1 „	..	..	..
6. Vices—						
Vertical 5"	2 „	..	..	..
Vertical 6"	2 „	..	..	..
Horizontal 5"	2 „	..	..	..
Horizontal 6"	2 „	..	..	..
7. Boring Bench 1-1/3 H. P.	1 „	..	..	..
8. Boring machine bel- ting type 18"	1 „	..	..	..
9. Shaper belting type 18"	1 „	..	..	..
10. Lathe, belting type 6"	1 „	..	..	..
11. Bench Cutter, 12"	1 „	..	..	..
12. Ventilator, 3" dia.	1 „	..	..	..
13. Metal Floor, 25- Kan-type 17"	1 „	..	..	..
14. Treadle Shearing machine	1 „	..	..	..
15. Tools	1 „	..	..	..
16. Dies without springs	1 „	..	..	..
17. Dies for a friction car type	1 „	..	..	..

Articles	Maker	Unit price	Rehabilitation	Industry and Supply	Rehabilitation	Industry and Supply
		\$			\$	\$
<i>Bamboo Industry—</i>						
Ueno's Bamboo needle cutting machine . . .	Ueno .	100·00	1 set	2 sets	100·00	200·00
64" Spare cutting set . . .	"	4·35	6 "	3 "	26·10	13·05
Miyoshi's Bamboo Loom 10'	Miyoshi	306·00	..	1 "	..	306·00
Miyoshi's Bamboo Loom 8'	"	278·00	1 "	..	278·00	..
Miyoshi's Bamboo Loom 6'	"	245·00	1 "	1 "	245·00	245·00
Hand Bamboo splitting tools	"	25·00	4 "	2 "	100·00	50·00
Ueno's Preparatory machine set (including 3 Peelers)	Ueno	130·00	1 "	1 "	130·00	130·00
Ueno's Bamboo Precision Drill	"	117·00	1 "	1 "	117·00	117·00
Bamboo cut samples	Adachi	16·62	..	2 "	..	33·2
Bamboo Button making plant	"	..	1 plant	..	1,180·00	..
Bamboo Plywood making plant	"	..	1 "	..	1,702·00	..
Ueno's spare Rings	Ueno	33·35	1 set	..	33·35	..
" Pointer	"	30·00	1 "	1 "	30·00	30·00
" Polishing machine	"	33·35	1 "	1 "	33·35	33·35
" Point Polishing machine	"	30·00	1 "	1 "	30·00	30·00
<i>Cloth from Rags—</i>						
Garabo Cotton making plant	Fukuya	..	1 plant	..	952·30	..
" Spinning plant	Hiyoshi	..	1 "	..	1,858·70	..
" Loom	Fukuya	208·50	2 sets	1 set	417·00	208·05
" Warping machine with accessories	"	77·00	..	1 "	..	77·00
" Pirm winder with accessories	"	44·00	..	1 "	..	44·00
Treadle spinning machines (10 spindles)	"	66·85	10 sets	..	668·50	..

Articles	Maker	Unit price \$	Rehabilita- tion	Industry and Supply	Rehabilita- tion	Industry and Supply
					\$	\$
<i> Cloth from Rags—contd.</i>						
Shibahara Type Treadle Twining Machine . .	Shibahara	6.00	10 sets	..	60.00	..
Preparatory machines for fibrous plants . .	Adachi	..	1 "	..	520.00	..
<i> Shoes Laces, Braids, etc.</i>						
Braiding machines and accessories . .	Kokubun	..	1 plant	..	1,100.00	..
<i> Vail Making—</i>						
Vail making machine, Type B . . .	Musoshi	440.00	2 sets	1 set]	880.00	440.00
<i> Spinning Machines—</i>						
Yamamoto Type Wool Spining machine . .	Yamamoto	8.00	1 set	1 set	8.00	8.00
Sakamoto's KS 1 spinning Wheel.	Yushin	20.00	6 "	5 "	120.00	100.00
Spinning Wheel . .	Koken	2.00	..	1 "	..	2.00
Shibaura's Hand Spin- ning machine . .	Shibaura	28.00	1 "	1 "	28.00	28.00
Domestic spinning and Twisting Frame, 20 spindles $\frac{1}{2}$ H. P.	Okuma	260.00	..	1 "	..	260.00
Spinning wheels (10 spin- dles) . . .	Toyota	85.00 (Metal)	..	1 "	..	85.00
		60.00 (Wood)	..	1 "	..	60.00
<i> Weaving Equipment—</i>						
Yoshino's Socks Making machine . . .	Yoshino	100.00	2 sets	1 set	200.00	100.00
Yoshino's Flat Knitting machine, 4 colour, 36" attachment . . .	"	542.00	1 "	..	542.00	..
Yoshino's flat knitting machine plain 32" .	"	321.00	1 "	..	321.00	..
Yoshino's flat knitting machine plain 28" .	"	267.00	..	1 "	..	267.00

Articles	Maker	Unit price	Rehabili- tation	Industry and Supply	Rehabili- tation	Industry and Supply
		\$			\$	\$
<i>Weaving Equipment—contd.</i>						
Hirofani Loom . . .	Hirofani	123·50	...	1 set	...	123·50
Jacquard and Accessories	"	70·00	...	1 "	..	70·00
Reeling machine (2 spdls.) & accessories .	"	21·67	...	1 "	..	21·67
Reeling & Weaving Set (29 items) . . .	"	668·20	...	1 "	..	668·20
Nisshoku's Loom of Foot operating type .	Nisshoku	..	4 sets	1 "	775·00	160·00
Fishing Net machines (Loom)	Nissin	84·00	...	1 "	..	84·00
<i>For Food Industries—</i>						
Simple Type Corn clean- ing machine . . .	Marukin	40·00	...	1 set	...	40·00
Biscuit Baker . . .	...	19·00	...	2 "	..	38·00
Pop Corn Machine .	Mikasaya	34·00	5 sets	1 "	170·00	34·00
Rice Pressing machine .	"	20·00	5 "	1 "	100·00	20·00
Candy Roller dia. 3½" .	"	117·00	3 "	1 "	351·00	117·00
Candy Ball Cutter 20 cm. dia w/a Syrup cutting Knife & acces- sories	"	14·40	3 "	1 "	43·20	14·40
Bean Roaster . . .	"	8·50	5 "	1 "	42·50	8·50
Sugar Cotton machine .	Kyoci	26·67	4 "	1 "	106·68	26·67
Wheat Flour machine .	Arisaka	20·40	1 "	1 "	20·40	20·40
Sugar Cane Crusher .	Koken	10·00	4 "	6 "	40·00	60·00
Suisen Type starch making machine .	"	86·67	...	1 "	...	86·67
Shimomura Type starch making machine .	"	78·00	...	1 "	...	78·00
1/8 H. P. Flour making machine	"	12·00	1 "	1 "	12·00	12·00
Starch manufacturing machine	Kuwano	384·00	1 "	1 "	384·00	384·00
Fodder cutting machine	Hinode	33·80	..	1 "	..	33·80
Noodle machine for Home use	Masaki	7·00 12·60 (Cutter)	50 " 5 "	10 " 1 "	350·00 63·00	70·00 12·60

Articles	Maker	Unit price \$	Rehabili- tation	Industry & Supply	Rehabili- tation \$	Industry & Supply \$
<i>For Food Industries—contd.</i>						
Noodle machine (Power & Hand) . . .	Arisaka	35·00	1 set	1 set	35·00	35·00
Hand Noodle machine .	„	4·80	..	1 „	..	4·80
<i>Oil Extracting Machine—</i>						
Hand driven oil Pressing machine . . .	Nippon Yuki	90·00	6 sets	2 sets	540·00	180·00
Hander oil Extractor .	Fukoku	175·00	2 „	3 „	350·00	525·00
<i>Miscellaneous—</i>						
Job Printing Machine .	Sakuria	25·00	10 „	2 „	250·00	50·00
Coal Briquette Machine	Nissin	240·00	..	1 „	..	240·00
Chenille material . .	Toa	..	1CS/ 4 types	..	273·00	..
„ sample toys .	Fibre	..	3 set of 50 toys	..	10·00	..
Bale-making machine .	Koken	10·00	4 „	6 „	40·00	60·00
Screen making machine (frame).	„	1·80	..	1 „	..	1·80
Cardboard cutter . .	„	18·50	1 „	1 „	18·50	18·50
Universal cutter . .	„	17·00	1 „	1 „	17·00	17·00
Paper Thread for Bag making . . .	Koyo	..	½ ton	..	1,550·00	..
Cloth cutting machine .	Hidaka	85·00 (AC) 95·00 (DC)	1 set 1 „	1 „ ..	85·00 95·00	85·00 ..
Rope making machine .	..	25·50	1 „	1 „	25·50	25·50
Straw softening machine	..	22·50	1 „	1 „	22·50	22·50
Bamboo screens for hand paper making . .	..	7·00	..	„	..	23·00

